ANEMIA AND TRANSFUSION DECISIONS IN THE INTENSIVE CARE UNIT

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Background: Anemia is frequently seen in critically-ill patients contributing to increased morbidity, mortality, and hospital stay.

In ICU, anemia is treated with allogenic blood transfusions. Audits show 95% of ICU patients have haemoglobin level below normal by ICU day-3 and 50% of critically-ill patients receive RBC transfusions, trigger being 8.5g/dl. Higher transfusion rates were associated with prolonged ICU stay.

Aim: To study transfusion thresholds and practices in Indian intensive care unit patients.

Materials and Methods: Patients admitted during October 2012-June 2013 to medical and surgical-ICU, with an anticipated stay greater than 48hrs were enrolled. Patients with known primary haematological disorder or who succumb to their illness or discharged within 24hrs of ICU admission were excluded. Patients were followed up throughout their stay until hospital discharge or if death occurred before that. Data collection included admission haemoglobin along with daily hemoglobin values, requirement of RBC transfusions with indication, pre-transfusion haemoglobin, length of ICU and hospital stay and outcome.

Results: 800 patients were enrolled. Overall, 38% of patients received transfusions with blood or blood products and 34% of patients received RBC transfusions. Most common indication for

transfusion was a drop in haemoglobin without overt bleeding, mean pre transfusion trigger was 7.0±1.6 g/dl. Mortality was 23% among those who did not receive transfusions and 30% among those who received packed cells. There was a statistically significant association between packed cell transfusions and prolonged ICU and hospital stay. Mean baseline haemoglobin was 10.7±2.8g/dl. Hemoglobin levels decreased throughout the duration of ICU stay. There was a statistically significant association between age, APACHE-II score, duration of ventilation and packed cell transfusion with mortality. After adjusting for other risk factors, APACHE-II score and ventilation duration remained significantly associated with increased mortality but no association was seen between receipt of RBC transfusion and mortality.

Conclusion: There was a significant drop in haemoglobin following admission to ICU. RBC transfusions were initiated below 7g/dl. Transfusion led to prolonged ICU and hospital stay and mortality in the transfused was significantly higher than in the non-transfused. Approaches should therefore be made to reduce RBC transfusions in critically-ill patients.

ABBREVIATION

Hb	Haemoglobin
RBC	Red Blood Cell
MICU	Medical Intensive Care Unit
SICU	Surgical Intensive Care Unit
WHO	World Health Organization
PO2	Partial Pressure of oxygen
P50	Partial pressure of oxygen at 50% saturation
PCO2	Partial pressure of carbon dioxide
2,3-DPG	2,3 Di-phosphoglycerate
DO2	Oxygen delivery
CaO2	Arterial oxygen content
VO2	Oxygen consumption
EPO	Erythropoeitin
rHuEPO	Recombinant Human erythropoietin
TNF	Tumour Necrosis Factor
IL	Interleukin
SA	Sialic acid
IDA	Iron deficiency anemia
AI	Anemia of inflammation
APACHE	Acute Physiological and Chronic Health Evaluation Score
SOFA	Systemic Organ Failure Assessment Score

FNHTR	Febrile Non Haemolytic Transfusion Reactions
TRALI	Transfusion Related Acute Lung Injury
TACO	Transfusion Associated Circulatory Overload
TA-GVHD	Transfusion associated Graft vs Host Disease
TRIM	Transfusion Related Immunomodulation
HLA	Human Leukocyte Antigen
HPA	Human Platelet Antigen
ABC Trial	Anemia and Blood Transfusion in Critical Care
TRICC	Transfusion Requirements in Critical Care
SOAP	Sepsis Occurrence in Acutely Ill Patients
ATICS	Audit of Transfusion in Intensive Care Study